LETTER FROM MAURICE HOSTEL.

My dear Friends,

I must just write a line to thank you for adopting my children in Hoxton. I cannot express my gratitude to you all. I should like to tell you shortly how I propose to spend anything you may give. The children meet every evening, except Saturday, from 6 to 7.30. Tuesday is taken up by the Band of Hope, and Wednesday is given to work for Foreign Missions. Monday, Thursday and Friday are days for amusement. On Monday we have girls only, and they sew, drill, dance, sing and play with toys. Thursday is the boys' night, and they play games most of the time. On Friday boys and girls meet together to read, and, thanks to the kindness of Miss Mason and several students, we have a large stock of charming books, which the children read eagerly. Silence is insisted upon, and the children are very good on the whole, although there are always one or two restless spirits, who whisper together, or change their book every five minutes, or constantly offer to "tidy" the books. I am sure you will be interested to hear that the boys appreciate "Library night" more than the girls. I always have a larger number; they are quieter and also keener. The library has been closed during the summer, but will re-open in October. Through the kindness of two students I have this year been able to occupy the boys on Thursdays with cricket in the playground, and they turn up well to it. Last year we closed early in June because the boys did not come, but we shall continue now until the school holidays begin.—With love and many thanks, Yours very sincerely.

Mabel Conder.

Maurice Hostel, 51, Herbert Street, Hoxton, N.

NOTES ON COMETS.

The year 1909 is one of great interest to those attracted by astronomy, and more especially by the doings of those erratic bodies the comets. Halley's comet is expected to return this year; possibly it will have been identified before this is printed.

The discovery of a periodic comet was first made by Halley. In 1682 he observed a large comet, and planned out its path in accordance with the principles of Newton. Halley then found that there were observations of comets recorded in 1607 and in 1531, and that his comet closely resembled these in appearance and in their orbits. Newton had shown that the path of comets was in the form of a parabola—a curve resembling the end of an ellipse in which the distance between the foci greatly exceeds the distance between the foci and the end curves. Halley's theory was that some comets moved upon elliptical orbits. After thoroughly testing his theory he prophesied another return of the comet he had observed in 1682 which would take place in the end of the year 1758 or at the beginning of 1759. The period of the comet, if unmolested, he estimated at seventy-five years, but he foresaw that the attraction of Jupiter would delay its return. On Christmas Day in 1758 the comet was first detected, although Halley of course was not alive to see it. The next return of Halley's comet was in 1835. Until the winter of 1909 it will not be visible to the naked eye, but with telescopes it will be seen in the North-East region of Orion during the month of October. Moving westwards, it will pass through the constellations of Taurus (the Hyades), Aries (to the South), and Pisces. The comet which appeared eleven years before Christ is identified with Halley's comet, and also the comet which so alarmed England in 1066, of which there is a picture in the Bayeux Tapestry.

"Lo! there once more—this is the seventh night!
Yon grimly-glaring, treble-brandished scourge
Of England!"

* * * * *

"Lord Leofwin, dost thou believe, that these
Three rods of blood-red fire up yonder mean
The doom of England and the wrath of Heaven?"

TENNYSON'S *Harold*, Act I. Scene I.

All the different planets of the solar system are influenced by the attraction of each other as well as by the great force of gravitation exercised by the sun. Comets must be admitted as members of our system, but it is well for the stability of the solar system that their mass is so inconsiderable (in comparison with the other heavenly bodies) that their erratic paths do not perturb the movements of the planets, though their own paths are very much altered when they approach other members of the system.

Astronomers are unable to calculate the weight of comets, it being so slight in comparison with the moon, Mercury, etc.; but even so its weight might be told in millions of tons. Comets differ in structure and form from all other heavenly bodies, and they vary very much in form and size even in a few hours. Astronomers tell us that a comet is formed of numbers of separate solid particles, widely scattered and surrounded by gas. The spectroscope has shown carbon to be present in comets to a large extent. The particles in the tail of a comet are so much scattered that if it passes between us and a star, the faintest star will shine with undimmed brightness through a veil of perhaps 100,000 miles in thickness. Sometimes when the nucleus of a comet passes in front of a star, it causes a little change in the lustre or in the position of the star; this is due to the refraction of the rays of light in their passage through the gaseous material.

In observing comets, we should notice especially the direction in which the tail lies. A comet's tail always points away from the sun, so that at sunset the comet has the

appearance of racing after the sun, whilst at sunrise the comet seems to be on its way to meet the sun. It is thus seen that the sun repels the tail. A comet when first seen has little or no tail, but, in approaching the sun, the tail increases in size until the comet swings round the sun and begins to recede. The first sign of the addition which has been observed is a jet of light sent out from the nucleus *towards* the sun, then, in a few hours, generally speaking, the jet is swung round away from the sun, leaving still some rings of light round the nucleus on the side nearest the sun. One might compare this process with the effect of drawing a leaden weight on a string through a slimy "plantation" of mare's-tail (Hippuris) up into the air above the water.

The repelling force in the sun is thought to be electricity. The existence of the same repulsive power in the nucleus would account for the sending out of the jet of light in the first place, and secondly for the remaining of the rings of light round the nucleus in spite of the sun's force; there are no absolute proofs of this theory, however. The tail is seen to curve backwards again from the direction in which the comet is moving, the degree to which it curves is thought to be determined by its composition. The force of gravitation being stronger upon the atoms in a tail formed principally of iron would cause such a tail to curve back more than a hydrogen tail would do. The curve of a hydrocarbon tail would be between the two. We owe this theory to Professor Bredichin, the Russian astronomer.

BELLATRIX.